

in the figure of the type specimen of *C. inornatus*. It is, in fact, extremely doubtful if there is sufficient information available to permit the proper generic determination of the latter. It is quite likely a *Protocalamites*.

This new plant, although only its vegetative features are known and those imperfectly, has a rather important morphological significance. Briefly, *Prossera grandis* is an early member of the Articulatae of early Late Devonian age (Portage). It shows definite whorls of large and long-divided leaves. The nodal structure suggests

affinity with the *Sphenophyllales*. The leaves are, however, far larger than those of the Carboniferous Articulatae. These large leaves in this very early type hardly support the frequent claims that the leaves of this group were originally microphyllous. Rather, the suggestion, based on arrangement of the known members of the Articulatae in chronologic order with *Prosseria* taking its place near, at least, to the base, is that the series may be one of reduction from megaphylls rather than expansion from microphylls.

MYCOLOGY.—*A new species of Protodontia from British Columbia.* G. W. Martin, State University of Iowa.

In January 1950 Dr. Ruth Macrae, of the Division of Botany and Plant Pathology, Department of Agriculture, Ottawa, Canada, sent me two specimens of a tremellaceous fungus, accompanied by careful notes and drawings, which obviously represented the same species but which were clearly distinct from any I had previously seen or to which I could find reference in the literature. Both had been collected the preceding year by W. G. Ziller on slash of black cottonwood in central British Columbia. The specimens, although sporulating freely, appeared to be incompletely developed and the assignment to a genus offered great difficulty, hence I laid them aside awaiting fuller information. Meanwhile, two additional collections from the same area were found in the collections at Ottawa, one collected by Mr. Ziller and one by Dr. M. K. Nobles. Dr. Macrae kindly sent me the balance of the material from Ottawa and Mr. Ziller let me see the even more abundant material of all four collections deposited in the Forest Pathology Collection of the Dominion Department of Agriculture at Victoria, British Columbia. On the basis of this material, I feel justified in describing the species.

Protodontia oligacantha, sp. nov.

Fructificationibus late effusis, resupinatis, tenuibus, mediis fuliginosis vel avellaneis, ad fimbrias albas pallescentibus; aculeis sparsis, fimbriatis, albis, ad 0.6 mm longis; hymenio in basidiis et dendrophysibus dense aggregatis consistente; subhymenio hyalino; hyphis fundamenti fulvis; probasidiis globosis vel pyriformi-

bus, plerumque $13-20 \times 9-12\mu$, denique cruciatim-septatis; epibasidiis crassis breviculis latis, $2-2.5(-3)\mu$; basidiosporis cylindraceo-curveis, apiculatis, $(9-10)10-12(-13) \times (4-4.5-5(-5.5))\mu$, per repetitionem germinantibus.

Broadly effused, up to 13×5 cm in extent, possibly larger, Benzo Brown to Cinnamon Drab, fading to buff or pallid near the broad, thin, fimbriate, white margin; waxy when moist, the hymenial surface drying horny; spines blunt, broad, somewhat fimbriate, white, up to 600μ long and 350μ in diameter at base, tapering toward tips, sparsely and irregularly distributed; in section $65-230\mu$ thick between the spines, composed of a colorless hymenial layer $20-40\mu$ thick, a yellowish basal layer of horizontal hyphae and an intermediate layer of variable thickness, clear yellow by transmitted light, which penetrates the spines, composed of indistinct agglutinated hyphae intermingled with crystalline accretions; hymenium continuous, covering both

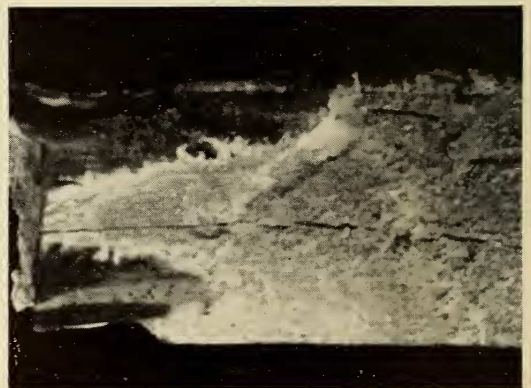


FIG. 1.—*Protodontia oligacantha*, type: Habit, $\times 1$, showing fimbriate margin.



FIG. 2.—*Protodontia oligacantha*, type: Longitudinal section of spine, showing hymenium and sterile tip, $\times 80$.

spines and area between them, except at tips of spines, composed of colorless basidia and dendrophyses; dendrophyses $3-4\mu$ in diameter at base, branching subdichotomously several times and irregularly attenuated toward the tips, sometimes with clamp-connections; probasidia globose to ovate or pyriform, mostly $13-20 \times 9-12\mu$, becoming cruciate-septate, each cell producing a thick, rather short epibasidium, $2-2.5(-3)\mu$ in diameter; basidiospores cylindrical to allantoid, usually with numerous small guttules, sometimes with 1-3 large guttules and numerous smaller ones, $(9-10-12(-13) \times (4-)4.5-5(-5.5)\mu$, germinating by repetition.

British Columbia: Cottonwood, August 3, 1949, W. G. Ziller, V-5013 (DAOM 21881), TYPE. Other collections examined: Cottonwood, July 26, 1949, M. K. Nobles, V-5247 (DAOM 22974); Cinema, August 11, 1949, W. G. Ziller, V-5084 (DAOM 22973) and V-5087 (DAOM 21934). All on dead wood of *Populus trichocarpa* T. & G. Numbers cited are those of Herb. Lab. For. Path. Victoria (V) and Myc. Herb. Sci. Serv. Dept. Agr. Ottawa (DAOM). Portions of all except V-5084 are in Myc. Coll. S. U. I.

The specific epithet is based on $\acute{\alpha}\lambda\iota\gamma\omicron\varsigma$, few, and $\acute{\alpha}\kappa\alpha\nu\theta\alpha$, spine.

The outstanding characteristics of *P. oligacantha* are the sparse development of the spines and the broad, spineless, fimbriate margin (Fig. 1). Where most abundant, the spines number 3-5 to a square millimeter. They are fertile over most of the surface, as is the hymenium between them, but the extreme tip is often sterile (Fig. 2), owing to protrusion of an extension of the intermediate yellow layer, giving them a fimbriate appearance when examined dry under a binocu-

lar. They tend to be borne in lines on whitish strands, which makes the hymenial surface appear faintly reticulate under a lens. Some specimens of *Eichleriella spinulosa* (B. & C.) Burt bear tubercles on the hymenial surface which may approach in abundance the spines of *P. oligacantha*, but the much thicker, darker fructification, the larger spores and basidia and the strongly determinate margin of the former species mark it as clearly distinct. The basidia and spores are of approximately the same size as those of *E. macrospora* (Peck) Martin, which may bear scattered tubercles and is sometimes subfimbriate and indeterminate when young, but the thick, determinate fructification of mature collections of that species and the characteristic texture, difficult to describe, but readily recognizable when known, make it impossible to consider it the same as the Canadian fungus. In the four ample collections which have been studied, there is no suggestion that *P. oligacantha* ever develops a determinate margin. It seems probable, however, that collections made later in the season might show a somewhat more extensive development of the spines. The basidia and spores (Fig. 3) are characteristic of the Tremellaceae. There is often a suggestion of a clamp connection at the base of the basidium, but in most cases this cannot be seen. The dendrophyses (Fig. 3. c) are rather difficult to see since the terminal portion does not stain.

The largest fructifications examined were 13×4 cm and 12×5 cm respectively, one of

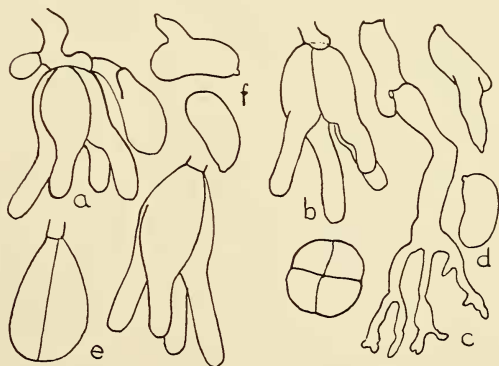


FIG. 3.—*Protodontia oligacantha*: a-d, no. V-5087. a, Two basidia and ovate structure, probably a very young basidium (note beak on basidium at right); b, two basidia, one in apical view; c, dendrophysis; d, two spores, one preparing to germinate by repetition. e-f, No. V-5013. e, two basidia, f, two spores, one preparing to germinate by repetition. All $\times 1,000$.

these measurements secured by matching two broken pieces. The growth may well become much more extensive.

Some years ago (*Mycologia* **24**: 508-511, 1932) I discussed the genus *Protodontia* with particular reference to our commonest species, which I referred to *P. uda* v. Höhn., and at that time commented on the genus *Protohydnum* Möll., in which *Protodontia* is often included. Recently (*Univ. Iowa Stud. Nat. Hist.* **19** (3): 63, 1952), I reported *P. piceicola* (Kühner) Martin from Ontario. A collection from Louisiana by Langlois, determined by him as *Protohydnum lividum*, in the herbaria of the U. S. Dept. of Agriculture and the Missouri Botanical Garden, may well be that species and a *Protodontia*, but the generic transfer should be made only by one who has access to adequate European ma-

terial. These seem to be the only species known from the United States and Canada.

Dr. M. A. Donk has been kind enough to let me see some of his notes on *Protodontia*. He believes that what I have referred to *P. uda* is in reality distinct from the European form. This may be correct. I have not seen enough European material to be certain it is not and have depended mainly on published descriptions for the determination of our collections. These, however, show substantial variation but nothing beyond what may, in my opinion, be considered as due to differences in degree of maturity or as responses to local environmental fluctuations. Whelden (*Mycologia* **29**: 100-115, 1937), who studied cytologically an American collection referred to *P. uda*, reports that his material had been compared with von Höhnel's type by Dr. D. P. Rogers, who found them to agree exactly.

ICHTHYOLOGY.—*Ten new American gobioid fishes in the United States National Museum, including additions to a revision of Gobionellus.* ISAAC GINSBURG, U. S. Fish and Wildlife Service. (Communicated by L. P. Schultz.)

During revisional studies of the genera of American fishes, the following 10 undescribed species and subspecies discovered in the U. S. Fish and Wildlife Service and the U. S. National Museum are here named and briefly described. All holotypes are deposited in the National Museum.

Figures of proportional measurements given below refer to percentages of the standard length. Lengths of the pectoral and ventral fins denote the length of their longest rays, from their point of articulation, as determined at the surface without dissection, to their distal margin. The given lengths of specimens refer to the total length, including the caudal fin, unless otherwise stated.

The numbers of fin supports are of paramount importance in the classification of fishes, including gobies. The precise structure of the fins of fishes in general, namely, the different kinds of fin supports comprising the fins, differs largely by family or other major taxonomic groupings. The variability and relative numbers of the different supports differ by species or population of lower rank, and also by higher taxonomic groups. The numbers of fin supports have been widely used in taxonomy; but the broader problem of the comparative morphology of the fins of fishes in general has been largely

neglected. Lately, this subject began to engage the attention of investigators. Hubbs (*Copeia*, 1943: 134; 1945: 75) raises the question of the use of a certain fin formula in describing gobioid fishes, in connection with a discussion of the structure of the fins of other fishes. Beebe (*Zoologica* **27**: 45, 1942) is of the opinion that the last two approximated dorsal rays of *Dixonina*—a genus belonging to a different order than gobies—and related genera should be enumerated separately instead of counting them together as one ray. However, a thorough study of the comparative morphology of the fins in the major groups of fishes still remains to be made. As the fin structure differs largely by major groups, the proper and most advantageous method of enumeration, and any formula expressing such enumeration, will differ by such major groups.

In the superfamily Gobiodea the structure of the fins is as follows: The first dorsal consists of flexible (with few exceptions), unsegmented fin supports which are evidently homologous with the pungent spines of other fishes having two dorsal fins. The first fin support of the second dorsal is, as the fin supports of the first dorsal, likewise flexible and unsegmented, and is presumably also homologous with the pungent spine in